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Anisomorpha ferruginea (Beauv.)
♂ and ♀

ENTOMOLOGICAL NEWS

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Another Case of Injury to the Human Eye by the Walking Stick, Anisomorpha (Phasmidae)

By RICHARD O. ALBERT, University of Texas, School of Medicine, Galveston, Texas

On the evening of Sunday, 18 August, 1946, I was rambling around in the woods at the Galveston County Fair Grounds near League City, Texas. A small bayou was nearby, and the lowlands here had a grove of large trees, mostly oak, and a rather heavy undergrowth of vines, weeds, etc.

When my two friends and I chanced upon the decaying stump of a tree lying in the undergrowth, curiosity dictated that I turn it over to see what was underneath. I noted a spider or two, and then my attention was attracted by a large grey-brown insect about three or four inches long sitting quietly on the under surface of the overturned stump. Closer observation revealed it to be not one insect but a pair in copulation.

The female was large and fat compared to the male, who was only about two-thirds as long as she was, and much thinner. He was on her back, with the caudal end of his abdomen curled down on the right side of her abdomen, the tip fastened to her genital pore on the ventral side.

When I touched the insects, the female started moving around rapidly, but the male seemed content just to sit and ride, only occasionally moving a leg or an antenna. After a moment the female stopped moving. On both insects I noted a tiny knob or protuberance on the dorsolateral surface of the prothorax, on the extreme anterior portion, but paid no particular attention to these structures at the time. I touched the insects again, and the female ran around for a moment and again stopped, sitting quietly with the male on her back.

I became more and more aware of a strong odor in the air, not pleasant, but not extremly unpleasant. In my opinion, it more nearly resembled the odor of the musk glands of the common garter snake than anything else I could think of. To make sure the odor was produced by the insects, I put my face down close to them to sniff. When it was still eight or ten inches away from the insects, however, I felt several tiny droplets of fluid strike me in the face, not all at once but in quick succession. I did not see the droplets at all, only felt them as they touched me. One or more struck me in the left eye, and in about four seconds I began to experience a severe burning sensation in that eye, with lacrimation. Blepharospasm became so pronounced that I could not keep the eye open. By great effort I could open it a little, but the muscle spasm was so severe that it closed the eyelids again almost immediately.

These reactions continued for some twenty minutes and then the burning pain, lacrimation and blepharospasm began to decrease in severity. The conjunctiva of the affected eye had become quite hyperemic by this time, but I could hold the eye open for short intervals now. I examined the insects again—not getting my face too close to them, however in an attempt to discover the source of ejection of the droplets. The only possibility seemed to be the tiny projections before mentioned, so we looked at them closely and touched them with a twig. They appeared wet, and bubbled very slightly when we touched them. We saw no droplets fly out, but noted that a rather thick, tenacious white material on them seemed to increase in amount at times, as though more were being secreted. When all this was wiped off, the protuberance appeared to have a tiny depression in the center, as though leading down into a duct. These protuberances were about alike in the male and female, except that they were larger and more prominent in the female. I concluded that they were the source of the toxic substance that had gotten into my eye.

I carried the insects in a paper cup until I found an empty whiskey bottle beside the road, to which bottle they were then transferred, still in copulation. My eye felt much better and,

about forty minutes after first receiving the droplets in my eye, I reached some water and washed it out with plain water. By that time only a little burning sensation remained though hyperemia was still marked. I did not notice any reaction from the few droplets that struck the face in places other than the eye. By the next morning the conjunctiva was only very slightly hyperemic. All symptoms had completely subsided.

I took the insects to my good friend, Professor R. W. Strandtmann of the University of Texas School of Medicine in Galveston. We kept them several days without knowing what to feed them. When bananas were tried, the female seemed to eat some, but the insects did not look too happy, even though they were still in coitus and had been ever since I had found them. After three days the male died and after four days the female died, still in copulation.

The insects were subsequently identified by Dr. A. B. Gurney of the U. S. National Museum as *Anisomorpha ferruginea* (Beauv.). He added that this species is very similar to *A. buprestoides* (Stoll) and may eventually prove to be the same as that species.

The injury to the eye, though painful, was much less severe and of much shorter duration than the case reported by Stewart [1] who gave an account of a similar incident in which vision was impaired for about five days.

Epiperipatus braziliensis (Bouvier) on Barro Colorado Island, Canal Zone

By Ross H. Arnett, Jr., Cornell University, Ithaca, N. Y.

The interesting note regarding the habitat of *Peripatus* published by Prof. W. A. Hilton (1) brought to mind observations made by Mr. K. E. Frick and the author in late November 1944 on Barro Colorado Island, C. Z.

[1] Stewart, M. A. Phasmid injury to the human eye. Can. Ent. 69: 84-86, 1937.

While in search of beetles in decaying logs, we encountered several specimens of Onychophora, determined as *Epiperipatus braziliensis* (Bouvier) (2). Of the many logs broken open, only two or three contained Onychophora. These logs were very damp. They were located high on the island, far from the drainage streams. Here the specimens were close together working their way under the loose bark and in the runways of the *Passalus* beetles. These specimens all readily emitted the characteristic white slimy, gummy secretion when disturbed. They were all brownish-maroon in color and varied from one inch to two inches in length.

Neither this rotting-log habitat nor the stream bed habitat reported by Prof. Hilton is at all unique for these organisms These are the normal habitats usually reported for Onychophora.

The apparent controversial report of the Barro Colorado habitats is easily explained by the difference in the date when the two separate observations were made. Prof. Hilton visited the island in March, or during the last part of the dry season. Mr. Frick and I made our observations in late November, or during the last part of the rainy season. It is therefore rather safe to assume that *Epiperipatus* spreads out and inhabits rotting logs during the rainy season when that situation would be damp enough for the needs of these thinly cutinized forms. During the dry season it would not seem unlikely that the only place they would be found would be under stones in stream beds where it would be dampest. Whether there is a migration or not is unknown. Likewise the method *Epiperipatus* utilizes for passing through an unfavorable season of the year is unknown.

References

(1) Hilton, W. A., Jour. Ent. and Zool., 38: 27, 1946.
(2) Clark, A. H., and Zetek, J., Proc. U. S. Nat. Mus., vol. 96, No. 3197, 1946, pp. 205–213.

Undescribed Species of Crane-Flies from the Western United States and Canada (Dipt.: Tipulidae). Part VII

By CHARLES P. ALEXANDER, Massachusetts State College, Amherst, Massachusetts

The preceding part under this general title was published in ENTOMOLOGICAL NEWS 57: 173–179, 1946. In this paper I am characterizing three further new species from California, the types being preserved in my collection of these flies. Specific acknowledgments are made under the individual species.

Tipula (Lunatipula) palmarum new species

Size medium (wing, male, 14 mm.); mesonotum buffy gray, the praescutum with four entire pale brown stripes; a central dark stripe on vertex, scutum and scutellum; femora and tibiae obscure yellow, the tips narrowly darkened; wings with a grayish tinge, restrictedly patterned with darker, including the pale brown stigma; obliterative band at cord restricted; male hypopygium with the basistyle extensive, thin and scooplike, entirely cut off from the sternite; ninth tergite having the caudal margin with a V-shaped notch, heavily blackened and thickened; inner dististyle with the outer basal lobe appearing as two strong slender rods, the outer ones stouter, terminating in two spinous points; eighth sternite at apex with a semicircular flap that bears two long brushes of roughened setae.

♂. Length about 13 mm.; wing 14 mm.; antenna about 3.9 mm.

Described from a dried specimen, including the hypopygial characters. Frontal prolongation of head buffy, with a conspicuous dark brown lateral line, nearly as long as remainder of head; nasus elongate; palpi brownish black. Antennae (male) moderately long, as shown by the measurements; scape and pedicel yellow, flagellum black; flagellar segments only moderately incised; longest verticils subequal to the segments. Head buffy gray, the vertex with a capillary dark brown median vitta.

Pronotum buffy, with a narrow darkened central spot. Mesonotal praescutum buffy gray with four entire pale brown stripes, the intermediate pair separated by a more buffy ground line that is approximately as wide; humeral region of praescutum with an extensive paler brown area; posterior sclerites of notum buffy, sparsely pruinose; scutal lobes each with two brown spots; a narrow brown central stripe on scutum, extending caudad over most of the length of the scutellum; mediotergite with this line scarcely indicated, the outer lateral portions provided with conspicuous erect setae. Pleura testaceous yellow. Halteres with stem yellow, knob weakly darkened. Legs with the coxae and trochanters testaceous yellow; femora and tibiae obscure yellow, the tips narrowly darkened; tarsi passing into darker brown; claws (male) with a weak tooth. Wings with a grayish tinge, the cord and veins beyond very narrowly and vaguely seamed with darker; prearcular field narrowly yellow; stigma pale brown; obliterative areas restricted, extending from the outer end of cell *R* across the basal half of cell *1st* M_2 into the base of cell M_3; no prestigmal or poststigmal brightenings; veins brown, more brownish yellow in the prearcular and costal fields. Squamal setae few; stigmal trichia lacking. Venation: *Rs* somewhat less than twice *m–cu*; R_{1+2} entire; petiole of cell M_1 shorter than *m*; M_{3+4} shorter than the basal section of M_{1+2}.

Abdominal tergites obscure yellow, with three broken brown stripes, the central one narrowly interrupted at the incisures; sublateral stripes much more broken but conspicuous, each dark area preceded by a clearer yellow spot on the base of segment; sternites yellow, weakly more darkened medially; hypopygium yellow. Male hypopygium with the basistyle entirely cut off from the ninth sternite by a suture, appearing as an extensive thin and scooplike plate, the dorsal portion with numerous long yellow setae; posterior margin above the suture with an additional pencil of long setae. Ninth tergite entirely separate from the sternite; viewed from above appearing slightly narrowed outwardly, the posterior border with a V-shaped notch, the margin heavily blackened and sclerotized, including the entire posterior margin of the tergal notch, this portion irregularly

toothed. Ninth sternite with its appendage relatively extensive, flattened, with inconspicuous setae, the longest at apex. Outer dististyle a small pale clavate structure. Inner dististyle appearing as a flattened-compressed blade, the beak jutting into the tergal notch; margin of beak blackened; lower beak lacking or very obtuse; on face of style at base of beak with a further blackened lobule or protuberance; what is interpreted as being the outer basal lobe consists of two slender rods or arms, the outer slightly stronger and curved, more or less expanded at tip, both the upper and lower apical angles further produced into acute spinous points, the space between the points with white setae; second arm lying more mesad at end of a flattened plate or flange, appearing as a more slender straight rod that is only a little shorter than the outer arm. Eighth sternite only slightly sheathing, the margin terminating in a semicircular flap that bears two long and dense brushes of roughened or crinkly setae.

Habitat.—CALIFORNIA. *Holotype:* ♂, Palm Canyon, Borego, San Diego Co., May 4, 1945 (A. L. Melander); Alexander Collection, through kindness of Dr. Melander.

The present fly is very distinct in its hypopygial characters, especially the tergite, inner dististyle and eighth sternite. In its general appearance it somewhat suggests species such as *Tipula* (*Lunatipula*) *boregoensis* Alexander, but is entirely different in hypopygial structure from all such flies.

TIPULA Linnaeus, subgenus **HESPEROTIPULA** new

Characters chiefly as in *Lunatipula* Edwards, differing in important differences in the genitalia of both sexes.

Wings of certain species, including the subgenotype, with sparse to more abundant macrotrichia in outer cells, particularly R_5. Male hypopygium with the ninth sternite very large, contiguous across the dorsum or virtually so, the eighth tergite and ninth tergite correspondingly reduced, the former semicircular in outline. Basistyle produced into elongate horns (except in *derbyi*). Ovipositor with the cerci reduced to small

rounded or semicircular knobs, much shorter than the elongate hypovalvae, the latter pointed at tips.

Type of subgenus.—*Tipula* (*Hesperotipula*) *streptocera* Doane.

Other included species: *circularis* new species (California); *contortrix* Alexander (California); *coronado* Alexander (Arizona); *derbyi* Doane (California); *fragmentata* Dietz (Washington, Oregon, California); *linsdalei* Alexander (California); *micheneri* Alexander (California); *mutica* Dietz (California); *opisthocera* Dietz (California); *ovalis* Alexander (California); *supplicata* Alexander (California); *trypetophora* Dietz (British Columbia).

Tipula monochroma Dietz, 1919 (*pleuracicula* Alexander, 1915) and *T. devia* Dietz, 1919 (*translucida* Doane, 1901) do not belong to this subgenus. As restricted, it is eminently characteristic of the Vancouveran and Californian regions, particularly the latter.

Tipula (Hesperotipula) circularis new species.

Allied to *streptocera;* male hypopygium with the dorsal portion of ninth tergite produced into two circular blackened lobes or blades, their margins smooth, the space between the lobes transverse; spine of basistyle long and sinuous, strongly narrowed outwardly but scarcely twisted; inner dististyle with the beak short and slender, blackened; outer basal lobe placed far basad, about on a level with the lower beak.

♂. Length about 12–14 mm.; wing 13–14.5 mm.; antenna about 3.8–4 mm.

♀. Length about 13 mm.; wing 15 mm.

Frontal prolongation of head brown above, including nasus, paling to obscure yellow on sides; palpi brown, the terminal segment brownish black. Antennae moderately long, as shown by the measurements; basal three segments yellow, succeeding ones brown. Head above brownish black, the surface heavily pruinose.

Thorax above almost uniformly shiny yellow or reddish yellow, the praescutal stripes poorly differentiated. Pleura some-

what clearer yellow. Halteres with stem brownish yellow, the base restrictedly yellow, knob dark brown. Legs with the coxae and trochanters yellow; femora yellow, the tips narrowly brownish black; tibiae and tarsi gradually more infuscated, the outer tarsal segments brownish black; claws (male) toothed. Wings with a weak brownish tinge, the vicinity of the veins beyond the cord paler; prearcular and costal fields more yellowed; stigma and a small spot at origin of *Rs* pale brown; obliterative areas at cord and beyond stigma; veins pale brown. Rather numerous macrotrichia in outer half of cell R_5; stigmal trichia few. Venation: *Rs* about two and one-half times *m–cu*.

Abdomen yellow to reddish yellow, the tergites more or less distinctly trivittate with brown, the median stripe becoming heavier and more evident on the outer segments; sublateral stripe more broken. Male hypopygium with the ninth tergite distinctive, the dorsal portion produced into two circular blackened lobes or blades, their margins smooth, the space between the lobes transverse. Basistyle with the spine long and sinuous, strongly narrowed but not twisted. Inner dististyle with the beak short and slender, blackened; outer basal lobe placed more basad than in *streptocera,* about on a level with the lower beak. Eighth sternite with the setae of the lateral lobes abundant and conspicuous; those of the median lobe also unusually numerous, somewhat variable in number but usually totalling at least a score.

Habitat.—CALIFORNIA. *Holotype:* ♂, Livermore, Alameda Co., May 1, 1939 (T. H. G. Aitken). *Allotype:* ♀, Fairfax, Marin Co., April 13, 1919 (E. P. Van Duzee); California Academy of Science. *Paratopotype:* 1 ♂, pinned with type; *paratypes:* ♂, Berkeley, May 4, 1919 (E. P. Van Duzee); ♂, Sonoma Co., April 4, 1914 (Knoch), received from Dietz, identified as *streptocera;* ♂, Alum Rock Park, Santa Clara Co., May 5, 1939 (T. H. G. Aitken).

The most similar species is *Tipula* (*Hesperotipula*) *streptocera* Doane, which differs conspicuously in the structure of the male hypopygium, including the tergite, horn of the basistyle, inner dististyle and eighth sternite.

Phyllolabis hirtiloba new species

General coloration of head and thorax light gray; wings with a very weak brownish tinge, the large oval stigma only a trifle darker than the ground; veins R_3 and R_4 relatively short, slightly divergent, so cell R_3 at margin is approximately one-third more extensive than cell R_2; male hypopygium with the appendage of the ninth sternite broad, the caudal margin widely and shallowly emarginate, the lateral angles produced into small pale lobes; apex of outer lobe of basistyle with a group of strong dark setae on mesal portion; outer dististyle a microscopic knob; gonapophyses very slender.

♂. Length about 7 mm.; wing 7 mm.

Rostrum dark brown, pruinose; palpi black. Antennae black throughout, scape pruinose; flagellar segments passing through oval to long-oval. Head light gray.

Thorax almost uniformly light gray, the praescutum without evident pattern. Halteres whitened. Legs with the coxae brown, gray pruinose; trochanters yellow; femora and tibiae obscure yellowish brown to pale brown, the tips somewhat more darkened; tarsi brownish black. Wings with a very weak brownish tinge, the large oval stigma only a trifle darker than the ground; prearcular field a little more brightened; veins brown, more yellowed at wing-base. Venation: *Sc* relatively short, Sc_1 ending a short distance beyond the fork of *Rs*, Sc_2 exactly opposite this point; veins R_3 and R_4 relatively short and markedly divergent so cell R_3 at margin is approximately one-third more extensive than cell R_2; vein R_3 only a little more than one-half R_{2+3+4}; *m–cu* shortly beyond the fork of M_{3+4} on M_4.

Abdomen dark brown. Male hypopygium with the appendage of ninth sternite wide, the caudal margin very broadly and shallowly emarginate, the small lateral lobes pale. Basistyle projecting beyond the point of insertion of the dististyles as a stout lobe, the apex a trifle widened, obliquely truncated; on mesal edge at and back from tip with numerous strong dark-colored setae; lower lobe of basistyle a strong clavate structure that is provided with scattered relatively short setae. Outer dististyle a microscopic knob; inner style large but still smaller

than the lower lobe of the basistyle, virtually glabrous, at apex narrowed into a lobe. Gonapophyses very slender, nearly straight.

Habitat.—CALIFORNIA. *Holotype:* ♂, Yosemite National Park, near Mirror Lake, altitude 4000 feet, June 6, 1939 (A. Downes).

Phyllolabis hirtiloba is perhaps most similar to species such as *P. claviger* Osten Sacken and *P. meridionalis* Alexander, differing from all described forms in every detail of structure of the male hypopygium, particularly the appendage of the ninth sternite, apical lobe of basistyle, and both dististyles.

Nocturnal Activities and Notes of the Ant Lasius (Acanthomyops) Interjectus Mayr

By HORACE GROSKIN

At my place in Ardmore, Montgomery County, Pennsylvania, there are three colonies of *Lasius interjectus,* which I had under observation from June 12th to August 20th, 1946. Many daylight observations were made during the period, as well as twenty-six night observations with flashlight at various hours from 10 P.M. to midnight, at temperatures ranging from 54°–82° F.

Colony No. 1 is a small colony with a mound nest located in short grass in clay soil, mostly shaded by a canopy of trees. Colony No. 2 is also a small colony with a crater nest located about 15 feet from colony No. 1, in clay soil, underneath a large Japanese maple without direct sun exposure. Colony No. 3 is a large colony containing an estimated 1,500 to 2,000 ants, including workers and sexual forms, located in the soil adjacent to a cinder-block garage wall facing eastward.

The nest of Colony No. 1 was observed on twenty-two nights; on nineteen of these nights, the workers were excavating soil, and on the three nights, the workers were inactive.

The nest of Colony No. 2 was observed on twenty nights, the workers being active carrying soil on fourteen nights and inactive on six nights.

The nest of Colony No. 3 was observed in daylight and at night from June 12th to July 29th, and while there was considerable activity on many days, these ants appeared on the surface of the ground on one night only.

The activity of the workers of Colony No. 1 and No. 2 consisted of bringing out soil while enlarging their galleries, and at no time, day or night, were they observed to forage, probably for the reason that this is a subterranean ant that feeds almost entirely on the excrement of root coccids and aphids which it attends inside of the nest.

Neither Colony No. 1 nor No. 2 was observed to swarm or to have a nuptial flight during the entire period of observation, possibly for the reason that they were young colonies and sexual forms had not yet been produced.

By referring to Table 1, it will be noted that when the ants were active at night, they were also active on many days during the daylight. For example, on July 9th, the workers of Colony No. 1 were carrying soil at 10 A.M., 5 P.M. and 8:30 P.M., and also at 12 midnight. The following morning, July 10th, at 10 A.M., the workers were still bringing out soil, and they continued to do so at 4 P.M. and again that night at 10:05 P.M. When observed the next morning, July 11th, at 10 A.M., the workers were still active, and at 10:30 P.M. that same night, they were as busy as ever. On the following morning, July 12th, at 10 A.M., the ants were again observed bringing out soil, and their activity was again noted at 4:30 P.M., and once more that night at 10:30 P.M. Altogether, these ants appeared to be active continuously for four days and four nights for the period from July 9th to July 12th. This same condition prevailed for the period from July 15th to July 18th, when there was continuous activity during day and night.

The number of workers participating in the work varied during the day and night. Uusually there were many more workers carrying soil at night than during daylight. Often at night there were twenty to thirty workers busily engaged, while in daylight the number rarely exceeded a dozen.

Low temperatures did not appear to affect the ants' activities. On July 15th at 11 P.M., the temperature was 54° F., and on July 16th at 11 P.M., the temperature was 55° F., yet on both

of these nights the ants were very energetically carrying on their work and their numbers were at the maximum.

When the night observations were made, the flashlight was often held within an inch of the workers, but the ants were not disturbed by the sudden light and continued their activities, moving along in a file, carrying soil.

It would be of interest to know whether the workers that were active at night were the same individuals that were observed working during the day, or whether they work in relays and have rest periods. This could be determined only by marking the individual ants, and it is my intention to do this next year, if I am able to find a method that will not disturb the ants' normal behavior.

Colony No. 3, a large and well-established colony, was observed from June 12th to August 20th, 1946. Altogether twenty-nine observations were made during daylight, and at night from 10 P.M. to midnight, at temperatures ranging at night from 54° to 82° F. As already stated, this colony appeared on the surface on one night only, July 24th, at 10:15 P.M., temperature 80° F., at which time about 300 winged forms and workers were noted swarming in the short grass close to the nest entrances.

From June 12th to July 29th, the ants of the colony swarmed on eighteen late afternoons, between 6 and 8:30 P.M., E.D.T., and made five nuptial flights between 6 and 7:30 P.M., E.D.T., at temperatures ranging from 72° to 78° F. These marriage flights occurred on June 12th–13th–15th–23rd–24th.

This colony was also under observation in 1945, when it made four nuptial flights between the hours 7:30—8:05 P.M., E.D.T., temperatures ranging 66° to 84° F. These nuptial flights occurred on June 8th–12th–14th–20th. It is interesting to note that the marriage flights of this colony were made on almost the same dates in both years.

It may also be of interest to note that a closely related species, *Lasius* (*Acanth.*) *claviger* Roger, which belongs to the same subgenus as *L. interjectus,* swarms and has its nuptial flights at an entirely different time of the year than *L. interjectus,* at least it does so at Ardmore, Pennsylvania.

TABLE 1

No. 1 Colony

Date 1946	E.D.T.	Temp. F.	Weather	Carrying Soil	Remarks
7/3	10 P.M.	68	clear	active	Workers inactive during daylight until 8 P.M.
7/4	10 P.M.	70	clear	inactive	Inactive 10 A.M., 7 P.M. and 10 P.M.
7/6	10 P.M.	82	clear	active	Inactive until 8:10 P.M.
7/7	10:45 P.M.	68	clear	active	Inactive during daylight and at 9 P.M.
7/9	12 midnight	70	clear	active	Active 10 A.M., 5 P.M. and 8:30 P.M.
7/10	10:05 P.M.	76	clear	active	Active 10 A.M., 4 P.M., inactive 8:45 P.M.
7/11	10:30 P.M.	74	clear	active	Active 10 A.M. 20 workers active at 10:30 P.M.
7/12	10:30 P.M.	—	clear	active	Many workers active 10 A.M., 4:30 P.M.
7/13	11:30 P.M.	70	clear	inactive	Active 2 P.M., inactive 8:15 P.M.
7/14	10:45 P.M.	76	clear	active	Inactive during day from 10 A.M. to 8:45 P.M.
7/15	11 P.M.	54	clear	active	20 workers active 5 P.M.
7/16	11 P.M.	55	clear	active	Active 10 A.M., inactive 5 P.M., active 7 P.M.
7/17	10:15 P.M.	64	clear	active	Active 10 A.M., inactive 5 P.M., active 7:30 P.M.
7/18	10:30 P.M.	70	clear	active	Active 10 A.M., 6:30 P.M., inactive 8:30 P.M.
7/19	10:30 P.M.	—	clear	inactive	No activity day or night
7/24	10:15 P.M.	80	clear	active	Heavy rain previous 4 days. Active 7:30 P.M.
7/25	10:15 P.M.	68	clear	active	Active 7:40 P.M.–8:30 P.M.
7/26	10:30 P.M.	57	clear	active	Inactive 7:30 P.M.
7/28	10 P.M.	66	clear	active	Inactive during daylight until 8 P.M.
7/29	11 P.M.	64	clear	active	Inactive 7:45 P.M. and 8:30 P.M.
7/30	10 P.M.	68	clear	active	Inactive 4:30 P.M. and 7:30 P.M.
7/31	10:15 P.M.	67	clear	active	Active 8:45 P.M.

TABLE 1—(*Continued*)

No. 2 Colony

Date 1946	E.D.T.	Temp. F.	Weather	Carrying Soil	Remarks
7/9	midnight	70	clear	active	Inactive during daylight
7/10	10:05 P.M.	76	clear	active	15 workers carrying soil at night observation
7/11	10:30 P.M.	74	clear	active	Inactive during daylight
7/12	10:30 P.M.	—	clear	active	Workers active 10 A.M.
7/13	11:30 P.M.	70	clear	active	Inactive in daylight
7/14	10:45 P.M.	76	clear	active	Inactive during the day
7/15	11 P.M.	54	clear	inactive	Inactive during the day
7/16	11 P.M.	55	clear	active	Inactive 10 A.M., 5 P.M., active 7 P.M.
7/17	10:15 P.M.	64	clear	active	Inactive 10 A.M., 7:30 P.M.
7/18	10:30 P.M.	70	clear	active	Inactive 10 A.M., 6:30 P.M., 8:30 P.M.
7/19	10:30 P.M.	—	clear	inactive	Inactive 10 A.M. and 5 P.M.
7/25	10:15 P.M.	68	clear	active	Inactive 7:40 P.M., active 8:30 P.M.
7/26	10:30 P.M.	57	clear	active	A few workers active 7:15 P.M.
7/28	10 P.M.	66	clear	active	Inactive 8:30 P.M.
7/29	11 P.M.	64	clear	active	Inactive 8 P.M.
7/30	10 P.M.	68	clear	inactive	Inactive during daylight
7/31	10:15 P.M.	67	clear	inactive	Inactive during daylight
8/5	10:15 P.M.	76	clear	inactive	Inactive during daylight
8/9	10:45 P.M.	69	clear	inactive	Inactive during daylight
8/11	11 P.M.	60	clear	active	Inactive during daylight
					Observations continued to August 20th, but no further activity was noted after August 11th.

I have five large colonies of *L. claviger* on my place, which I have had under observation for the past five years, and at no time during this period have I ever observed any swarming or nuptial flight before the latter part of September, and from that time on, according to my notes, throughout October and November, and I have one record of swarming and nuptial flight as late as December 3rd, 1943, at 4:20 P.M., E.W.T., temp. 52° F.

This perhaps would indicate that some of the sexual forms of *L. interjectus* remain in the nest during the winter, and have their nuptial flight the following spring, while the sexual forms of *L. claviger* are born and raised during the same year and are not ready to leave the nest until autumn or late in the year.

Distributional Notes on Lauxaniidae Mostly from the Great Smoky Mountains National Park (Diptera)

By George C. Steyskal, Detroit, Michigan

The writer and Robert R. Dreisbach spent a week, beginning June 10, 1946, in the Great Smoky Mountains National Park collecting insects and enjoying the park and Dr. Arthur Stupka's hospitality. The following eight species of Lauxaniidae were secured. While the list is but fragmentary, it contains several interesting distributional records and for that reason is considered worth presenting. The localities cited are all in the Tennessee part of the park, except Andrews Bald, which is in North Carolina. Previous locality records known to the writer both from the literature and from material he has examined are given in parentheses after the Smoky Mountains data.

Homoneura fraterna Lw. Chimneys Camp, June 11 (Ont., Que., Man., entire New England, N. Y., N. J., Pa., Va., Md., Mich., Ill., Calif., Wash.).

H. houghi Coq. Park Headquarters, June 10 and 15; also Cumberland Co., Tenn., June 10 (Que.; Mt. Desert, Me.; Mass.;

R. I.; Conn.; N. Y.; N. J.; Va.; Md.; Raleigh, N. C.; Isle Royale and Cheboygan Co., Mich.; Sylvan Lake, S. D.).

Lauxania cylindricornis Fabr. Andrews Bald, June 16 (Alaska and throughout Canada; New England; N. Y.; N. J.; Pa.; Md.; Ga.; Ft. Myers, Fla.; Mich.; Wis.; Minn.; S. D.; N. M.).

Lauxaniella opaca Lw. Cades Cove, June 13; Headquarters, June 13 (N. J.; Murfreesboro, N. C.; Fla.).

L. trivittata Lw. Headquarters, June 10 (Md.; D. C.; Tenn.; Ga.; Ala.; Fla.).

Minettia lupulina Fabr. Chimneys Camp, June 11; Cherokee Orchard, June 14; Andrews Bald, June 16 (South to mountains of N. C.; Carter Co., Tenn.; Kans.; Colo.).

M. magna Coq. Chimneys Camp, June 11; Elkmont, June 15 (D. C.; N. J.; Md.; Raleigh, N. C.; Battle Creek, Mich.).

Xenochaetina muscaria Lw. Cades Cove, June 13 (N. J.; Md.; Raleigh, Rockingham, and Yonahlossee Road, N. C.; Ala.; Oxford, Miss.; La.; Fla.; Cuba; Mexico; So. Amer.).

A New Subspecies of Speyeria atlantis (Edwards) from New Mexico (Lepidoptera: Nymphalidae)

By A. H. Moeck,* Milwaukee, Wisconsin

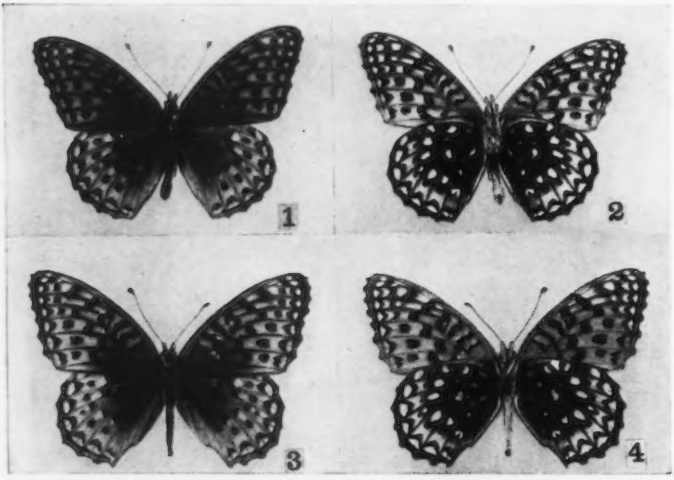
Speyeria atlantis dorothea, new subspecies

Above, both sexes are fiery ruddy, similar in size and wing-shape to *atlantis nausicaa* (Edwards) (1874, p. 104), the latter being a subspecies described from Arizona. In *dorothea* the basal suffusion usually is somewhat heavier and the black pattern markings bolder, thus *dorothea* is in these respects darker than the usual run of *nausicaa*.

Below, *dorothea* in both sexes differs from *nausicaa* in color, especially in the disk or basal two-thirds of the secondaries. In *nausicaa* the discal area is sordid reddish-brown which upon

* Assistance furnished by L. P. Grey, of Lincoln, Maine, is gratefully acknowledged.

close examination is seen to be flecked extensively or entirely overlaid with delicate hoary lavender. In *dorothea* the disk lacks this lavender entirely or nearly so, while the ground color is richer, ranging from shades of deep mahogany-red to brick-red. The spots below are brilliantly silvered, as in *nausicaa,* the submarginal band also being similar in color and extent; however, both stand out more contrastingly in *dorothea* because of the darker, more uniformly colored background.



SPEYERIA ATLANTIS DOROTHEA, new subspecies
1. Holotype ♂
2. Holotype ♂, under surface
3. Allotype ♀
4. Allotype ♀, under surface

Genitalically, the species *atlantis* (Edwards) (1863, p. 54) appears to be indistinguishable from the various species placed by dos Passos and Grey (1945, pp. 1–29, figs. 1–54) in their "*callippe* group." In a later elaboration an effort will be made to clarify the interrelationships of the southwestern subspecies of *atlantis,* and to indicate that *dorothea* represents an important link in these relationships, with *nikias* beyond Santa Fe to the north and east, and *nausicaa* to the westward in Arizona.

In wing expanse a series of fifty pairs of *dorothea* averaged 68 mm. in the males, 76 mm. in the females, the variation in size ranging from smallest male 62 mm. to largest female 82 mm. By way of comparison a like series of *nausicaa* measured 60 to 72 mm. in males, and 68 to 86 mm. in females, averaging the same size as *dorothea* except that females of *nausicaa* run a trifle larger. The subspecies *atlantis nikias* (Ehrmann) (1917, p. 55) is smaller, averaging in a series of ten pairs of topotypes, 62 mm. in males, and 66 mm. in females. The holotype of *dorothea* expands 68 mm. (All measurements were taken from tip of primary wing to center of thorax, doubled.)

Type Material: A long series of *dorothea* was collected by the author on Sandia Peak (Sandia Peak is in extreme southeastern Sandoval County bordering upon Bernalillo County, some fifteen miles northeast of and overlooking Albuquerque), Sandia Mountains, NEW MEXICO, July 13 to 15, 1946, at elevations ranging from six to over ten thousand feet. The specimens were taken from the very peak to two-thirds of the way down the mountain, along the winding road which leaves Highway 44 and runs thence to the tip in a general southwesterly direction. The *holotype* male and *allotype* female were taken, *in copula,* July 15, at about 7,000 feet elevation. They have been deposited in The American Museum of Natural History, New York City. Of the type catch mentioned above, 100 males and 100 females are designated *paratypes* which are in the author's collection; a number of them will be distributed to various museums and individuals.

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Notes and News in Entomology

Under this heading we present, from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when used.

The Rockefeller Foundation, A Review for 1946. From this annual review the following passages have been selected as of interest to entomologists. They deal with the mosquito campaign in Italy and with the yellow fever work.

A large factor in the reduction of malaria in Italy since 1887 has been the great amount of intelligent land reclamation. Work in the Tiber delta was begun between 1885 and 1890, but it was not until after World War I that extensive agricultural drainage was undertaken. . . . But World War II again brought a setback in the struggle against malaria, due to the systematic destruction by the German Army of the great land-reclamation projects. . . . In the whole of Italy the incidence of malaria in 1944 was five or six times as great as before the war. Indeed, in Littoria Province, south of Rome, malaria rates were 55 times their normal figure.

At the invitation of the Army, the Foundation undertook the study of the use of DDT against *Anopheles labranchiae,* a house infesting malaria vector. Armed with knapsack sprayers, teams of workers systematically covered a 120-square-mile area, spraying the walls and ceilings of every room in every building, from large apartment houses to rabbit hutches. Marshy areas were sprayed by Army planes with tanks of DDT or Paris green mounted in the bomb-bays.

Weekly inspections for larvae and adults were made for almost a full year to determine the effectiveness of the measures taken. According to one member of the Health Commission: "The total catch of adults for the 120-square-mile area by our inspectors for the season probably does not equal the number formerly found in one day in one good-sized pigsty."

Three times before in the history of the Roman Campagna since pre-Roman times the abandonment of hydraulic works due

to war brought on a widespread plague of malaria. Each time, two centuries were needed to bring the area back to a normal state of health. The fourth time that war devastated this area, it took one thorough application of DDT to reduce the danger of malaria infection almost to zero.

As regards yellow fever, the Review reports increased activity at the laboratories at Lagos, Nigeria and at Entebbe, in the Uganda. An epidemic in Nigeria, centering at Ogbomoshi, the first major outbreak in 15 years, was the classic type of urban yellow fever caused by an old enemy, *Aedes aegypti.*

The jungle type of yellow fever is more easily studied in East Africa, where it occurs unmixed with the urban variety and where *aegypti* does not complicate the picture. Jungle yellow fever is caught only by human beings who enter the forest or who live on its outskirts. In this eastern section of the broad African belt the disease is apparently maintained by arboreal mosquitoes and animals until it is transmitted to man.

There is much supporting evidence for the theory that monkeys, whose population in this region is estimated at 400 per square mile, keep yellow fever alive, aided perhaps by a mosquito. The mosquito strongly suspected is the *Aedes africanus,* which breeds in tree holes and at night bites the monkeys which sleep in the trees. This still does not bring yellow fever to the ground where men can catch it. There are, however, certain arboreal monkeys which enter home gardens to steal bananas and thus bring themselves within the range of both men and another mosquito, *Aedes simpsoni.* Contaminated originally by the *africanus* mosquito, the monkey may in turn contaminate the *simpsoni* mosquito, which in its turn relays yellow fever to the human victim.

Much of this comes under the head of enlightened conjecture, but yellow fever research in the African laboratories is proceeding vigorously, and the mysterious activities of African mosquitoes are beginning to be a little less puzzling than they were formerly.

Current Entomological Literature

COMPILED BY EDWIN T. MOUL, RAYMOND Q. BLISS, CHARLES HODGE IV, MAURICE E. PHILLIPS, JOHN W. H. REHN AND HENRY K. TOWNES, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

NOTE: The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the List of periodicals and serials published in our January and June issues. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

New Titles of Periodicals and Serials Referred to

101. Mitteilungen der schweitzerischen entomologischen Gesellschaft, Bern.
102. Revue de Entomologie. Rio de Janeiro, Brasil.

GENERAL—Bondar, G.—Bavineos em monocotiledoneas da familia das Bromeliaceas um novo genero e 18 especies novas. [102] 17: 313–38 (k). **Hinton, H. E.**—A new classification of insect pupae. [72] 116: 282–328, ill. **Kantmann, B. P.**—Spontaneous mutation rate in Drosophila. [3] 81: 77–80. **Ligondes, J. de**—La preparation des petits insectes. [110] 3: 30–32. **Mayr, E.**—The naturalist in Leidy's time and today. [62] 98: 271–76. **Tempere, G.**—L'instinct botanique des insectes phytophages. [110] 2: 219–24. **Wade and Caffrey**—Rufus Hiram Pettit. (Obituary.) [65] 49: 87.

ANATOMY, PHYSIOLOGY, MEDICAL—Dobzhansky, T.—Effectiveness of intraspecific and interspecific matings in Drosophila pseudoobscura and D. persimilis. [3] 81: 66–71. **Häfliger, E.**—Beitrag zur Biologie und Bekämpfung der Azaleenmotte Gracilaria azaleella Brants. [101] 20: 141–60, ill. **Morrison, W.**—The chordotonal organs of insects. [100] 25: 50–52, ill. **Rohm, P. B.**—Study of evolutionary chromosome changes in Sciara (Diptera), chromosome C in the salivary gland cells of S. ocellaris and S. reynoldsi. [3] 81: 5–29, ill. **Webb, J. E.**—Spiracle struc-

ture as a guide to the phylogenetic relationships of the Anoplura (biting and sucking lice), with notes on the affinities of the mammalian hosts. [72] 116: 49–119, ill. **Zalokar, M.**—Anatomie du thorax de Drosophila melanogaster. [Revue Suisse de Zoologie] 54: 17–53, ill.

ARACHNIDA AND MYRIOPODA—Bryant, E. B.—The genotype of Mimetus Hentz. [73] 53: 48. **Denis, J.**—Araignees rares. [110] 3: 1–9, ill. **Gibson, W. W.**—An ecological study of the spiders of a river-terrace forest in western Tennessee. [58] 47: 38–44. **Kohls, G. M.**—Notes on the tick, Ixodes howelli, with descriptions. [46] 33: 57–61, ill. **Mello-Leitão, C. de**—Arañas nuevas de mendoza, la Rioja y Cordoba colectadas por el Prof. M. Biraben. [Revista del Museo de la Plata] 3: 101–21, ill. (*); Arañas de la Provincia de Buenos Aires. *Ibid.* 311–93, ill. (*). **Radford, C. D.**—New species of larval mites (Trombiculidae) from Manipur State, India. [72] 116: 247–65, ill. **Strandtmann and Eads**—A new species of mite, Ichoronyssus dentipes (Liponyssinae), from the cotton rat. [46] 33: 51–56, ill.

SMALLER ORDERS—Brues, C. T.—Dragonflies as predatory enemies of the stable-fly (Stomoxys calcitrans). [73] 53: 50–51. **Burks, B. D.**—New Heptagenine Mayflies. [5] 39: 607–15, ill. **Christiansen, K. A.**—A new record of Oxyagrion (Zygoptera). [73] 53: 89. **Eads, R. B.**—A new species of flea from the field mouse, Baiomys taylori. [5] 39: 545–48, ill. **Geijskes, D. C.**—Observations on the Odonata of Tobago, B. W. I. [88] 97: 213–35 (k). **Gisin, H.**—Sur la nomenclature de quelques genres importants de Collemboles. [101] 20: 135–36. **Hopkins, G. H. E.**—Notes on mallophagan nomenclature I. [30] 80: 14–19. **Kennedy, C. H.**—Epigomphus subquadrices, a new dragonfly (Gomphidae) from Panama, with notes on E. quadrices and Eugomphus n. subgen. [5] 39: 662–66, ill. **Randolph and Eads**—An ectoparasitic survey of mammals from Lavaca County, Texas. [5] 39: 597–601. **Rapp, W. F., Jr.**—The generic and subgeneric names of Japygidae, with their genotypes. [5] 39: 704–5. **Sommerman, K. M.**—A revision of the genus Lachesilla north of Mexico (Corrodentia: Caeciliidae). [5] 39: 627–61, ill. (k*). **Traver, J. R.**—Notes on Neotropical Mayflies. Part I. Family Baetidae, subfamily Leptophlebiinae. [102] 17: 418–36, ill. (*). **Webb, J. E.**—(See under Anatomy).

ORTHOPTERA—Ebner, R.—Einige seltenere paläarktische Tettigoniidae und Gryllidae. [112] 22: 17–30, ill. (*). **Liebermann, J.**—Sobre una coleccion de Acridios Paraguayos de la mision cientifica Brasileña, 1940–1944. [102] 17: 452–56. **Rehn, J. A. G.**—On the Punctulatus species-group of the genus Melanoplus (Acrid., Cyrtacanth.) with the description of a new sp. from Kansas. [62] 98: 241–69, ill. (k).

HEMIPTERA—Delong and Hershberger—Some new species of Idiocerus (Cicadellid) from the upper Mississippi Valley. [58] 47: 45–48, ill. **Esselbaugh, C. O.**—A study of the eggs of the Pentatomidae. [5] 39: 667–91, ill. (k) **Hsiao, T.-Y.**—The genus Eccritotarsus Stal. with descriptions of a n. gen. and two n. sp. (Mirid.) [65] 49: 59–62; A n. gen. and sp. of Miridae from Guatemala. *Ibid.* 63–65. **Jeannel, R.**—Les Henicocephalides. Monographie d'un groupe d'Hemipteres hematophages. [107] 110: 273–368, ill. (k*), 1942. **Knowlton, G. F.**—A new maple aphid from Utah and some aphid records. [43] 20: 24–26. **Knowlton and Roberts**—Artenisaphis artenisicola (Williams). [43] 20: 26–27 (*). **Melis, A.**—Contributo alla conoscenza dell' Aspidiotus perniciosus. [106] 29: 1–170, ill. **Penner, L. R.**—Some notes on the genus Pentagramma and four n. sp. [43] 20: 30–39, ill. (k). **Wygodzinsky, P.**—Contribution towards the knowledge of the genus Malacopus, with the description of two new species (Reduviidae). [102] 17: 457–67, ill. (*k); Sobre um novo genero de Harpactorinae do Brasil, com notas sobre os generos Harpactor Laporte e Erbessus Stal. *Ibid.* 401–17, ill. (k*).

LEPIDOPTERA—Capps, H. W.—Description of the larva of Keiferia peniculo Heinrich, with a key to the larvae of related species attacking eggplant, pepper, potato and tomato in the United States (Gelechiid). [5] 39: 561–63, ill. (k). **Häfliger, E.**—(See under Anatomy.) **McGuffin, W. C.**—Larvae of some Canadian Geometrids. [23] 78: 160–62 (k). **Nabokov, V.**—Southern Pierids in New England. [73] 53: 42. **Oiticica Filho, J.**—Nova especie do genero Paradaemonia e notas sobre as especies afins (Arsenurinae). [Summa Brasiliensis Biologiae] 1: 143–54, ill. **Silva e Heinrich**—Stenoma decora (Stenomatidae), uma nova praga potencial do cacaneiro na Baia, Brasil. [102] 17: 361–74, ill. **Sylven, E.**—Systematic studies of the Swedish species of Pyralinae, Nymphalinae and Pyraustinae. [10] 38A: No. 13: 1–37, ill. (k).

DIPTERA—Alexander, C. P.—New nearctic craneflies (Tipulidae). Part XXVII. [23] 78: 155–59; Notes on the tropical species of Tipulidae, genus Teucholabis. [102] 17: 375–400 (*). **Bequaert and Renjifo-Salcedo**—Tabanidae of Colombia. [73] 53: 52–88 (k*). **Blanchard, E. E.**—Los Dipteros muscoideos del Museo de la Plata, Tachinidae. [Revista del Museo de la Plata] 3: 123–61, ill. (*). **Bohart, G. E.**—The phorid flies of Guam. [71] 96: 397–416 (k*). **Bouvier, G.**—Malformations chez les Tabanides. [101] 19: 692–94, ill. **Brooks, A. R.**—A revision of the N. A. spp. of Leschenaultia sens. lat. (Larvaevor.). [23] 78: 169–82 (k*). **Brues, C. T.**—(See under Smaller Orders.) **Callan, E. McC.**—A note on Sarcophaga lambens, a parasite of the South American bollworm, Sacadodes pyralis. [102] 17: 474–75. **Cresson, E. T., Jr.**—Synopses of N. Amer. Ephydridae. III. Tribe Notiphilini of Subfamily Notiphilinae. [83] 72: 227–40 (k*); A systematic annotated arrangement of the genera and species of the Ethiopian Ephydridae. Subfamily Psilopinae. *Ibid.* 241–64 (k*). **Dobzhansky, T.**—(See under Anatomy.) **Fairchild, G. B.**—Additional notes on the Tabanidae of Panama. [5] 39: 564–75, ill. (*). **Forbes and Horsfall**—Biology of a pest mosquito common in New Guinea. [5] 39: 602–06. **Hardy and McGuire**—The Nearctic Ptiolina. [43] 20: 1–15, ill. k*). **Horsfall and Porter**—Biologies of two malarial mosquitoes in New Guinea. [5] 39: 549–60, ill. **King and Hoogstraal**—New species of New Guinea Uranotaenia of the Tibialis group (Culicid). [5] 39: 585–96, ill. (k). **Knight and Laffoon**—The oriental species of the Aedes (Finlaya) Kochi group (Culicid). [83] 72: 203–25, ill. (k*). **Lane, J.**—New Brazilian Mycetophilidae (Nemocera). [102] 17: 339–60 (*). **Lopes, H. De Souza**—Contribuicão ao conhecimento das especies do genero Oxysarcodexia (Sarcophagidae). [Boletim da escola Nacional de Veterinaria, Rio de Janeiro] 1: 62–134, ill. (k*). **Melander, A. L.**—Some fossil Diptera from Florissant, Colorado. [73] 53: 43–48, ill. (*). **Penn, G. H.**—The larval development and ecology of Aedes (Stegomyia) Scutellaris (Walker) in New Guinea. [46] 33: 43–50, ill. **Pratt, H. D.**—The genus Uranotaenia Lynch Arribalzaga in Puerto Rico. [5] 39: 576–84, ill. (k). **Pratt, H. D.**—Shannonomyina, new name for Shannonomyia Dyar (not Alexander) (Psychodid). [65] 49: 86. **Reinhard, H. J.**—New genera and species of muscoid Diptera. [43] 20: 15–24. **Rock-**

wood; Zimmerman and Chamberlin—The wheat stem maggots of the genus Meromyza in the Pacific Northwest. [90] 928: 1–18 (k). **Rohm, P. B.**—(See under Anatomy.) **Vargas, L.**—Corethrella laneana n. sp. (Culicidae), procedente de Monterrey, N. L. [78] 7: 63–67, ill. (k); Macropelopia roblesi (Tendipedidae) n. sp. Neotropical procedente de Chiapas, Mexico. *Ibid.* 79–84, ill. **Zalokar, M.**—(See under Anatomy.)

COLEOPTERA—Alfaro, A.—Medios quimicos para exterminar el escarabajo de la patata. [Iberica, Barcelona] 3: 41–44, ill. **Bradley, J. C.**—Contributions to our knowledge of the Mylabridae, seu Bruchidae, with especial reference to the fauna of northeastern America. [73] 53: 33–42 (k*). **Buchanan, L. L.**—Hickory Curculios of the genus Conotrachelus. [65] 49: 41–54 (k*). **Frost, C. A.**—Polydrusus sericeus Schall. [73] 53: 51. **Hustache, A.**—Nouvelle contribution a L'Etude des Ceuthorrhynchininae (Curculionid). [102] 17: 444–51 (*). **Lanchester, H. P.**—Larval determination of six economic species of Limonius (Elaterid). [5] 39: 619–26, ill. (k). **Sanderson, M. W.**—The N. A. sp. of Stilicolina Casey (Staph.). [43] 20: 27–30 (k*). **Servadei, A.**—Contributi alla conoscenza dell'entomofauna delle leguminose foraggere. Phytonomus nigrirostris F. [106] 30: 129–79, ill. **Villiers, A.**—Revision des Languriides de l'Ancien monde. [L'Abeille, Paris] 37: 1–320, ill. (k*), 1945.

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Review

INSECT MICROBIOLOGY an account of the microbes associated with insects and ticks with special reference to the biologic relationships involved. By Edward A. Steinhaus. Comstock Publishing Company, Inc., Ithaca, New York. 1946. x + 763 pp. Price: $7.75.

In this important book the information concerning various associations and interrelations between microbes (bacteria, rickettsiae, yeasts, fungi, viruses, spirochaetes and protozoa) and insects and ticks has been brought together for the first time. The need for such a work has long been felt by those interested in various aspects of entomology and other biologists. The volume has attempted to summarize under the various categories the results of much widely scattered information and the many discoveries of the author. Although such a work is definitely needed one can not help but think that a more useful work would have been achieved if such broad coverage had not been attempted.

The presentation of material is by type and location of the microbe, with their classification explained. However, this leaves one interested in a particular group of insects without a concise picture. The hosts are listed but as their position in the insect classification is not well indicated one must check to ascertain the group represented.

The portions on extracellular and specific bacteria associated with insects is based mainly on the author's previous catalogue. In the section on intracellular bacteriumlike and rickettesialike symbionts the discussion of the morphology of insect sex organs, mycetome and embryology seem out of place. However, this is followed by an interesting discussion on the nature, origin, transmission and cultivation of the symbiont forms. Selected examples of these are then discussed under an arrangement according to host.

The chapter on Rickettsiae is certainly the most interesting and instructive of the book. The author's knowledge of this field is such that it is regretted that it was not further expanded, even at the expense of some of the other sections.

Finally there is an interesting chapter on the little understood subject of immunity in insects. This is followed by a general discussion of methods and procedures which should be of use to those interested in work along these lines.

The extensive bibliography in itself makes the volume of considerable value and while not attempting completeness can easily be used as a starting point for gathering supplementary information.

J. W. H. REHN

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

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